What Is Claimed Is:

1. A method for monitoring vibration levels associated with a rotating component and establishing an alarm setting therefor, the method comprising the steps of:

a) measuring an operating parameter and a corresponding set of vibration amplitudes for a rotating component during a period of operation;

b) normalizing the set of measured vibration amplitudes based on established amplitude limits for the rotating component so as to define a set of normalized amplitude data points, wherein the established amplitude limits are a function of the measured operating parameter for the component;

c) storing the set of normalized amplitude data points into parameter-based data blocks, each data block extending over a predetermined range of the operating parameter;

d) estimating, for each data block, a time period remaining to reach the established amplitude limits based on changes in the normalized amplitude data points stored in the data blocks over the period of operation; and

e) establishing an alarm setting based on the estimated time period remaining to reach the established amplitude limits for each data block.

2. A method according to claim 1, the method further comprising ensuring that the measured operating parameter for the component is approximately constant over a predetermined data collection period prior to measuring the corresponding set of vibration amplitudes.

3. A method according to claim 1, wherein the step of measuring a corresponding set of vibration amplitudes includes conditioning measured vibration accelerations for the component using a Fast Fourier Transform.

4. A method according to claim 1, further including the step of providing an alarm signal based on the alarm setting if at least one of the measured vibration amplitudes exceeds an established amplitude limit.

5. A method according to claim 1, the method further comprising measuring a frequency of rotation for the component during a period of operation.

6. A method according to claim 5, the method further comprising storing the set of normalized amplitude data points into parameter-based data blocks which extend over a range of about 3% of a rated speed for the component and the data blocks have a spacing of about 1% of the rated speed.

7. A method according to claim 1, the method further comprising measuring a rotational torque for the component.

8. A method according to claim 7, the method further comprising storing the set of normalized amplitude data points into parameter-based data blocks which extend

over a range of about 10% of a rated torque for the component and the data blocks have a spacing of about 5% of the rated torque.

9. A method according to claim 1, further comprising the step of interpolating the normalized amplitude data points stored in each of the parameter-based data blocks so as to estimate the time remaining to reach the established amplitude limits.

10. A method for monitoring vibration amplitudes associated with a plurality of rotating components and establishing an alarm setting for each component, the method comprising the steps of:

a) measuring an operating parameter for each of a plurality of rotating components;

b) measuring a corresponding set of vibration amplitudes for each of the plurality of rotating components during a period of operation;

c) selecting a rotating component from the plurality of rotating components to be monitored;

d) conditioning the set of vibration amplitudes so as to eliminate vibration amplitudes corresponding to unselected components in the plurality of components and creating a set of remaining vibration amplitudes;

e) normalizing the set of remaining vibration amplitudes based on established amplitude limits for the selected component so as to create a set of normalized amplitude data points, wherein the established amplitude limits are a function of the measured operating parameter for the selected rotating component;

f) storing the set of normalized amplitude data points for each component into associated sets of parameter-based data blocks, each data block extending over a predetermined range of the measured operating parameter;

g) estimating, for each data block, a time period remaining to reach the established amplitude limits based on changes in the normalized amplitude data points stored in the sets of parameter-based data blocks over the period of operation; and

h) establishing an alarm setting for the selected component based on the estimate time period remaining to reach the established amplitude limits for each of data block.

11. A method according to claim 10, the method further comprising ensuring that the measured operating parameter for each component is approximately constant over a predetermined data collection period prior to measuring a corresponding set of vibration amplitudes.

12. A method according to claim 10, wherein the step of measuring a corresponding set of vibration amplitudes includes conditioning measured vibration accelerations for each component using a Fast Fourier Transform.

13. A method according to claim 10, further including the step of providing an alarm signal based on the alarm setting if at least one of the measured vibration amplitudes exceeds an established amplitude limit.

14. A method according to claim 10, the method further comprising measuring a frequency of rotation for the component during a period of operation.

15. A method according to claim 14, the method further comprising storing the set of normalized amplitude data points into parameter-based data blocks which extend over a range of about 3% of a rated speed for the component and the data blocks have a spacing of about 1% of the rated speed.

16. A method according to claim 10, the method further comprising measuring a rotational torque for the component.

17. A method according to claim 16, the method further comprising storing the set of normalized amplitude data points into parameter-based data blocks which extend over a range of about 10% of a rated torque for the component and the data blocks have a spacing of about 5% of the rated torque.

18. A method according to claim 10, further comprising the step of interpolating the normalized amplitude data points stored in each of the parameter-based data blocks so as to estimate the time remaining to reach the established amplitude limits.

19. A system for monitoring vibration levels associated with a plurality of rotating components and establishing an alarm setting for each component, the system comprising:

a) means for measuring an operating parameter for each of a plurality of rotating components;

b) means for measuring a corresponding set of vibration amplitudes for each of the plurality of rotating components during a period of operation;

c) means for selecting from the plurality of rotating components a component to be monitored;

d) means for conditioning the set of vibration amplitudes so as to eliminate vibration amplitudes corresponding to unselected components in the plurality of components and creating a set of remaining vibration amplitudes;

e) means for normalizing the set of remaining vibration amplitudes based on established amplitude limits for the selected component so as to create a set of normalized amplitude data points, wherein the established amplitude limits are a function of the measured operating parameter for the selected rotating component;

f) means for storing the set of normalized amplitude data points for each rotating component into associated sets of parameter-based data blocks, each data block extending over a predetermined range of the measured operating parameter;

g) means for estimating, for each data block, a time period remaining to reach the established amplitude limits based on changes in the normalized amplitude data point stored in the data blocks over the period of operation; and

h) means for establishing an alarm setting for the selected component based on the estimate time period remaining to reach the established amplitude limits for each of data block.

20. A system as recited in claim 19, wherein the means for measuring a set of vibrations amplitudes for a plurality of rotating components during a period of operation includes at least one vibration sensor.

21. A system as recited in claim 20, wherein the means for measuring a set of vibrations amplitudes for a plurality of rotating components during a period of operation includes two vibration sensors.

22. A system as recited in claim 19, wherein the means for means for measuring an operating parameter for each of a plurality of rotating components includes at least one speed sensor for detecting and signaling frequency of rotation for one of the plurality of rotating components.

23. A system as recited in claim 19, wherein means for measuring a corresponding set of vibration amplitudes includes means for conditioning measured vibration accelerations for each component using a Fast Fourier Transform.

24. A system as recited in claim 19, further including means for providing an alarm signal if one of the measured vibration amplitudes exceeds an established amplitude limit.

25. A system as recited in claim 19, wherein the measured operating parameter is a frequency of rotation for the selected component.

26. A system as recited in claim 19, wherein the measured operating parameter is a rotational torque for the selected component

27. A system as recited in claim 19, wherein the selected component is an engine shaft, bearing or gear.